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AUTHOR Rosenfeld, Joel
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ABSTRACT

The Metropolitan Library Service Agency (MELSA) of Minneapolis/St. Paul was formed through an agreement among local library districts to share collections, services, and loans. During the formative years of the program, state aid for regional library development was apportioned to local branches on a per capita basis. Since this method did not reflect actual use patterns, a study was initiated to ascertain the portion of each library's budget spent on interlibrary sharing and to measure use of each library's facilities by the other libraries. Tabular results of the survey are provided. (EMH)

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A Report On MELSA's Cost-Use Study

by
Joel Rosenfeld
Director, Metropolitan Library Service Agency
with extensive reference to
a technical report by Gary Shirk

Introduction

Last year, about twelve million items were circulated from public libraries in the Twin Cities Metropolitan area. More than one million of those items were loaned to people who visited a library outside their own library districts. Sharing public library resources is a major accomplishment of the Metropolitan Library Service Agency, MELSA. MELSA is studying the impact of this program on library use patterns and on the institutions which are participating. This is a description of that study and what it has revealed so far.

The commentary on costs which follows and the commentaries on other aspects of the study which are set off by an asterisk are based largely on a report from Gary Shirk. Mr. Shirk is the Library Management Analyst for Hennepin County Library and a member of the Study Committee. He was given a special commission to review the steps taken in performing the study to determine that the results follow logically and to apply statistical tests to the survey results to determine the limits within which the findings can be accurately stated.

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MELSA and Reciprocal Use

MELSA was organized in 1969 under a contract between Minneapolis, St. Paul, Ramsey County and Hennepin County to improve and to cooperate and coordinate library services. Over the past six years, the contract has been extended to include the remaining counties in the Twin Cities metropolitan area. A major accomplishment of this cooperation was to make the collections and services of all the libraries available to Twin Citians as they move across library districts on their way to work, shop, study, or play.

The Need to Measure

Each library in MELSA is supported from taxes on property within its service area. By agreeing to share resources and services each library takes on a potential additional number of users and accordingly an additional burden on its staff and materials. To ease any burden a community's library may incur in this cooperation, MELSA uses part of the money it receives in state aid for regional library development to reimburse the libraries for some of the corollary costs. During the formative years of the program, before regular patterns of use had evolved, the amounts of the reimbursements were based upon the size of the library district and were computed on per-capita basis. Now that crossover between library districts is well established, a more appropriate method of reimbursement could be found in measuring the crossover usage and the costs it involves.

The Study Design

Library operations are a good deal more complicated than most people understand. The range of public services offered is quite broad although the main functions are the circulation of popular materials, dissemination of information, and the maintenance and organization of information bearing materials numbering in the millions of items. These functions interrelate within each library and the configurations of service programs vary between branch agencies and departments of the larger libraries and between different library systems. Isolating specific programs for study is very difficult. Even approximating an appropriate way of measuring costs and use of particular services requires the skills of special analysts. For this reason, a consulting firm experienced in the complex analysis of library operations, WESTAT, Inc. of Rockville, Md., was hired to design the study and, in the initial plan, to carry it out.

Although after the design of the study was established the libraries decided to carry it out by themselves, WESTAT's contribution was essential. In meetings with the librarians, the consultants helped to establish the specific objectives of the study and a realistic expectation of what information could be derived. The study design, delivered in November, 1974, stated the objectives, defined the services that could be studied, detailed the methods by which data could be collected, and provided formulas with which to analyze the data to answer the specific questions agreed upon. WESTAT's design divided the study into two parts, cost ascertainment and crossover use, each of which would attempt to isolate and measure circulation activities, reference services, and interlibrary lending.

Implementing the Study

After the design was received, it was reviewed by a committee of librarians and the MELSA Director. The committee recommended that the study be carried out under the direction of the MELSA office in concert with the committee. This has resulted in a slower implementation and a delay in obtaining useful results, but these disadvantages are compensated by a number of substantial benefits.

1. Local people have gained intimate knowledge of the study and the data to insure access to explanations, interpretations, and recommendations for changes at times in the future after formal contracts with the consultants would have elapsed.
2. All the data and interpretative materials are maintained locally for reference, verification, or use by the libraries for additional analysis they might attempt.
3. The study could be repeated without further recourse to outside contractors.
4. The cost of implementing the study was about 1/3 of the contractor's projected costs.

What follows is a description of the main

points of the study and a summary of what it has revealed.

Studying the Costs of Services

Although each library would like to know its actual costs in performing an average crossover transaction, the requirements of this study are met by a determination of the proportional relationships between the costs of circulation, reference and interlibrary lending. There are several reasons why it was not possible to determine a cost for the average crossover transaction. Costs naturally vary from library to library according to many factors. It was decided to not pursue those factors which involve comparisons of internal organization and management decisions. Therefore, it was agreed that averaged unit costs for the MELSA libraries would suffice. Furthermore, cost accounting to the extent necessary to determine the allocation of absolute costs to various functions would have been prohibitively expensive and still not satisfy all of the problems associated with using unit costs, some of which are noted below.

*Two categories of costs were studied: overhead costs, for which information was gathered by an accountant using a questionnaire developed by the committee and approved by the MELSA Advisory Board, and Service Salaries based upon samples of logged time submitted by library staff and allocated to Circulation, Reference, Interlibrary Loan and other functions (the "other" being allocated to Overhead). In addition, the annual expenditures reported by the libraries for library materials were apportioned to Circulation, Reference, and Interlibrary Loan according to the volume of those activities. Variations in bookkeeping from library to library prevented the collection of precise and identical data in each expense category, but having a trained accountant collect the information at each library increased the uniformity of the reports and decreased the likelihood of response error.

We cannot assert that unit costs based on this data are accurate estimates of the cost of an average MELSA crossover transaction for the following reasons:

1. No provision was made to exclude costs that a MELSA library would incur even if MELSA agreements did not exist.
2. All elements of costs were included in the data even if they were not directly related to Circulation, Reference, or Interlibrary Loan. Including these elements helped assure the proportional validity of unit costs for these functions, but they may appear to inflate the unit costs for each of the functions.
3. No estimate was made of the sensitivity of unit costs to variations in unit volume, (i.e., the correlation between increases or decreases in units and increases or decreases in costs).

Despite our inability to accurately estimate "real" unit costs, we can be reasonably confident that the study has provided accurate proportional relationships between the unit costs of circulation, reference, and interlibrary loan. The relative values will be used to compute fair shares of the funds that will be allocated annually for reimbursements.

Studying Circulation Crossover

*Circulation crossover was defined by the committee as any transaction for another MELSA library appearing on a member library's circulation record. The University of Minnesota's statistics laboratory, directed by Professor Frank Martin, developed a formula for sampling the libraries based on the amount of circulation at each agency and the expected crossover activity. MELSA requested circulation records from each member library without specifying particular dates. It is assumed that the proportion of crossover would not change with variations in volume over periods of time. The records were sampled and tabulated to estimate the percentage of crossover for each agency within each system. Total annual crossover estimates were calculated by multiplying the percentage estimates by the reported 1974 circulation counts.

Table I summarizes the results of the crossover circulation estimates. Host library systems (named in the left-hand column) provided service to patrons representing Guest Systems named along the top. Total crossover for the Host is shown to the far right. Along the bottom of Table 1 is the total number of Service Units received by each Guest System. There is a range of accuracy associated with each of the esti-

Table 1

CROSSOVER CIRCULATION

OVERALL SUMMARY Note: Totals figured separately on original data, so rows and columns will not necessarily add up.

HOST \ GUEST	Minneapolis Public Lib.	St. Paul Public Lib.	Anoka Co. Lib.	Dakota Co. Lib.	Hennepin Co. Lib.	Ramsey Co. Lib.	Scott Co. Lib.	Washington Co. Lib.	CARVER & OTHER	TOTAL RANGE
Minneapolis Public Lib.	—	45,000	20,000	11,000	247,000	21,000	3,000	2,000	0	350,000 ± 21,500
St. Paul Public Lib.	19,000	—	800	35,000	3,000	93,000	0	100,000	2,000	253,000 ± 19,000
Anoka County Lib.	16,000	300	—	0	11,000	54,000	0	0	2,000	82,000 ± 10,000
Dakota County Lib.	0	5,000	0	—	0	0	9,000	0	1,000	15,000 ± 8,100
Hennepin County Lib.	308,000	6,000	7,000	20,000	—	27,000	4,000	164	300	372,000 ± 26,000
Ramsey Lib. County	2,000	51,000	1,000	500	1,000	—	0	27,000	700	83,000 ± 12,100
Scott County Lib.	500	0	0	2,000	0	0	—	0	700	3,000 ± 1,500
Washington County Lib.	0	1,000	0	0	0	2,000	0	—	0	2,000 ± 3,800
CARVER & OTHER	0	0	0	0	0	0	0	0	0	
TOTAL RANGE	345,000 ±25,300	108,000 ±13,500	29,000 ±7,200	69,000 ±11,300	261,000 ±19,800	196,000 ±17,100	16,000 ±8,000	129,000 ± 13,600	6,000 ±3,600	1,161,000 ± 42,500

mates within the table, but to simplify the chart they are shown only in the totals columns on the bottom and right-hand side.

The accuracy of the crossover totals are generally quite good. For example, Minneapolis Public as a Host provides about 350,000 circulation transactions annually; no more than 350,000 plus 21,500 and no fewer than 350,000 minus 21,500. In terms of Minneapolis Public's annual circulation, its MELSA crossover is estimated with an accuracy within one per-cent, (plus or minus 1%).

Total Guest transactions also have a range of accuracy, and they are read in the same way. But they cannot be logically related to annual Host circulation in order to determine how much precision those ranges represent. In respect to total crossover transactions, Minneapolis people as Guests represent about 29.7%, (plus or minus 2.2%). It should be noted that the estimates for Host services and Guest use cannot be related one to the other without broadening the range of accuracy or error by their sums.

Studying Reference Services

In contrast to the simple definition of a crossover circulation, the definition of what reference work includes and the establishment of a convenient unit for counting had to be worked out with great care. WESTAT's design devoted five pages to the subject. One intriguing aspect of the discussion is whether particular categories of questions have some unique average unit costs. This could be a factor worth consideration if crossover usage was measurably heavier in categories with unique costs. It was on this account that the survey form required entries under various categories and an estimate of the amount of time spent on each transaction. An analysis of the reference survey showed that special weightings to categories of questions had an insignificant affect on either the estimates of crossover use or the amounts of reimbursement that would result.

*Reference Count

The WESTAT Report as adopted for the study objectified reference work by counting the number of titles consulted for each question. For example, a person who calls to ask for the specific title, Jaws, would be counted as "one", and the person who called for something on dogs and was referred to five titles would generate a count of "five". The units counted represent special work units developed to establish a common denominator between author/title requests, simple or complex reference questions, and their variations when conveyed by telephone or in person. A unit, therefore, does not necessarily symbolize a single reference encounter or questions. It does, however, represent about one person/minute of reference activity. This device proved useful for the following reasons:

1. Reporting consistency from one member library agency to another is considered more important than describing a "true" reference question.
2. Counting titles established a consistent unit of work, of equal length of time, whether measuring simple author/title requests or "complex" reference questions.
3. The titles counting method was different enough from that presently used by member libraries that there was little fear of confusing MELSA count with one used in a particular system.

The estimates on Table 2 represent relative annual volume of true reference crossover activity.

Five days were selected for the survey at random from a six week period. The accuracy is affected by two factors: (1) the short period from which the days were selected, and (2) the small number of days given to the survey, but the relative percentage of crossover among systems is not likely to be biased appreciably. We can make the following conclusions about the reference estimates:

1. Annual volume estimates were based on insufficient observations to guarantee reliability (the five day total was simply multiplied by 52). There is the danger that the sample period was one of unusually high or low activity.
2. Because counts were large, we can be assured that the crossover percentages shown for Host systems is accurate.
3. Unfortunately, without repeating the reference study we cannot be sure the high volume days were not sampled in one system and low volume days in another. As a rule, however, libraries in adjacent areas exhibit similar periods of

Table 2

CROSSOVER REFERENCE

OVERALL SUMMARY **Note:** Totals figured separately on original data, so rows and columns will not necessarily add up.

HOST \ GUEST	MPL	SPPL	ACL	CAR	DCL	HCL	RCPL	SCLS	WCL	OTHER	TOTAL
Minneapolis Public	—	73,000	40,000	5,000	19,000	405,000	45,000	6,000	3,000	33,000	629,000
St. Paul Public	17,000	—	1,000	0	24,000	5,000	48,000	400	28,000	20,000	145,000
Anoka County	6,000	300	—	0	50	700	7,000	0	400	800	16,000
Carver County	0	0	0	—	0	0	0	0	0	0	
Dakota County	200	2,000	0	0	—	100	0	3,000	3,000	1,000	10,000
Hennepin County	75,000	2,000	2,000	7,000	9,000	—	3,000	2,000	300	5,000	105,000
Ramsey County	500	8,000	700	0	100	1,000	—	0	5,000	2,000	17,000
Scott County	0	100	0	1,000	200	800	400	—	0	100	3,000
Washington County	0	0	0	0	0	0	800	0	—	200	1,000
TOTAL	99,000	86,000	44,000	13,000	53,000	413,000	104,000	11,000	40,000	61,000	925,000

Note: The units counted are special work units as described in the text of the report. They do not necessarily symbolize a single reference encounter or question.

Table 3

CROSSOVER VOLUME

LIBRARY SYSTEM	CIRCULATION	REFERENCE	INTERLIB.LOAN	CREDITS
Unit Cost Ratio	1	1.9	11.3	
Minneapolis	350,000	629,000	28,622	1,868,529
St. Paul	251,000	145,000	5,574	589,486
Anoka County	80,000	16,000	4,164	157,453
Dakota County	14,000	10,000	3,262	69,861
Hennepin County	371,000	105,000	2,055	593,722
Ramsey County	83,000	17,000	1,186	128,702
Scott County	3,000	3,000	931	19,220
Washington County	2,000	1,000	2,292	29,800
			Total Credits	3,456,773

high and low activity. The days sampled in the study were the same for all agencies surveyed. We can therefore safely use the present figures as a first approximation of the relative volume of crossover units among MELSA member systems. Future studies will improve the reliability substantially.

Studying Interlibrary Loan

Measuring Interlibrary Lending had none of the problems associated with Circulation and Reference because by definition every such transaction was a "crossover" and needed no special survey. MELSA currently reimburses libraries for interlibrary loans on the basis of number of requests received and items delivered. Existing records were satisfactory for determining the amount of activity. The only change is the incorporation of those figures into the comprehensive reimbursement formula which WESTAT recommended.

The only judgment required was whether to count "requests received" or items delivered. It was decided that requests received are a better indicator of the labor involved and give a truer picture of the costs of participating as a lender for each library system. It may be argued that this decision rewards an inefficient practice, but the remedy should be found in re-designing the interlibrary loan procedures and not in the reimbursements formulas. The volume of interlibrary loan activity is recorded on Table 3.

Utilizing the Study

Circulation Study

A major reason for the creation of MELSA was the assumption that people would enjoy the benefits of access to the metropolitan area public libraries without restrictions due to library district boundaries. The study shows that reciprocal borrowing accounts for almost 10% of the total circulation of materials in MELSA libraries, amounting to almost 1.2 million transactions in 1974. This estimate is accurate to within one-half of one percent.

It is possible to chart the amounts and sources of crossover for each branch agency in the study, but the range of error connected with those estimates is too great to be reliable. Repititions of the study could improve the accuracy. The number of observations for each library system, however, is sufficiently large to be confident of both the amount of crossover and identification of the Guest's home libraries within reasonable limits. It is interesting to note which libraries receive crossover use and the library districts from which those users come. Regular continuation of the surveys can verify the consistency of those patterns and should show up the

Table 4

SAMPLE REIMBURSEMENTS FOR CROSSOVER USE

If F dollars were available for reimbursements for Reciprocal Borrowing, Reference, and Interlibrary Loan on the basis of total units of service, the MELSA library systems would earn as follows:

	F = $300,000	F = $400,000	F = $500,000
Minneapolis	$162,150	$216,200	$270,250
Saint Paul	51,150	68,200	85,250
Anoka County	13,650	18,200	22,750
Dakota County	6,060	8,080	10,100
Hennepin County	51,540	68,720	85,900
Ramsey County	11,160	14,880	18,600
Scott County	1,680	2,240	2,800
Washington County	2,580	3,440	4,300

effects of opening or closing library facilities, changes in hours, new public transportation routes, etc.

Reference Study

Because of the special purpose of the study and the device employed to determine counting units for reference transactions, the numbers derived do not relate to any previous measurement of reference service generally employed in the MELSA libraries. As was already pointed out, it will require repititions of the study to build a satisfactory level of reliability for the projections of annual volume for the counting units we used. There are, however, a sufficient number of observations in each system to reliably estimate the proportion of reference service that is crossover. Studying the patterns of crossover use of reference service will prove useful in itself and also in comparison with the circulation study.

Formulas for Reimbursement

The formulas for reimbursement require estimates of the number of crossover service units rendered by each library system for Circulation, Reference, and Interlibrary Loan and an indicator for the relative costs for each service unit in those categories. The results of the study so far can be used to demonstrate how the reimbursement formulas would work. A determination of how much money each library system should receive cannot be made until after more reliable projections of the numbers of reference units can be determined by continuing the survey.

The scheme for computing crossover credits is illustrated in Table 3. The credits for each system shown in the last column is found by multiplying crossover volume by the unit cost ratios and summing:

Credits = (1 x Circ. Units) + (1.9 x Ref. Units) + (11.3 x ILL Units)

If F is the total funds available for reimbursements, then the proportion of such funds to be distributed to each library is F x *Library's Credits/Total Credits* Table 4 shows how much each library system would receive if the total funds available were $300,000, $400,000 and $500,000.

A Word on Doing it Ourselves

Earlier in this report, we mentioned some of the benefits of carrying out the study by ourselves and noted some of the disadvantages. We saved to the end an acknowledgement of the burden this course has placed upon key individuals and groups and to whose cooperation we owe great thanks. The MELSA Board of Trustees and the Advisory Board which on one hand are the recipients of the service also served as decision-makers at appropriate points of the study. The Cost-Use Study Committee, Audrey Anderson, St. Paul, Geraldine King, Ramsey County, Gary Shirk, Hennepin County, and Lillian Wallis, Minneapolis, took on the burden and the responsibility of redesigning the study and monitoring the collection of data and its analysis.

The important role that WESTAT, Inc. played was mentioned before. Nancy Roderer was their staff member in charge of the project. Special expertise was also

supplied by an Accountant, Robert N. Koppy, CPA, The University of Minnesota Statistics Laboratory, directed by Professor Frank Martin, and Gary Shirk who reviewed the study and tested the results and whose report was cited extensively. The services of a number of people who helped with the tally and tabulation were essential to the study.

Finally, nothing could have been accomplished if it were not for the cooperation of library staff who responded so readily to the logs, diaries and statistical reports they were asked to supply. The Cost Study was especially demanding on the bookkeeping personnel who cooperated extensively with the Accountant and with the MELSA office in supplying essential information.

Gloria Schultz assisted with the administration of the study and managed the communications, correspondence, acquisition of supplies, and preparation of this report.